the one chip CPU 1, a control signal output line from output C of the one chip CPU 1, a ROM (not shown) that stores programs and a RAM (not shown) that stores data in calculations. The one chip CPU 1 produces display data using the programs stored in the ROM in accordance with the save power mode data inputted to port P1 from encoder 502 and remaining time data inputted to port P2 from the remaining time arithmetic circuit 516. The display data from the output D of the CPU 1 are transferred together with the control signal from the output C of the CPU 1 to display control circuit 505.

As described above, an operator can understand how long the battery can supply power if the personal computer 103 is operated in the current power saving mode and can decide an appropriate power saving mode for a desired operating time. The operator can also set an appropriate power saving mode which corresponds with the desired operation and the desired operating time by operating the rotary switch 501.

In the embodiment, the portable electric equipment is explained as a personal computer, but electrical equipment may be a word processor, an electric pocket notebook or portable calculator. Further in this embodiment, the power saving mode and the related estimated operating time are superimposed on the power saving condition display unit 107, but the power saving mode and the remaining battery capacity mode may be displayed in displays as described below.

(Second Embodiment)

Fig. 6 is a block diagram showing the construction of electric equipment which is, for example, a personal computer in a second embodiment. In Fig. 6, a numeral 1101 is a power saving mode switching unit. A numeral

1102 denotes a power saving mode display unit for displaying a selected power saving mode by the power saving mode switching unit 1101. A numeral 1103 denotes a power saving mode control unit for controlling ~~executing~~ the power saving mode to execute ~~control unit for executing~~ the power saving mode ~~which is~~ selected by the power saving mode switching unit 1101 on a personal computer unit 1104. A numeral 1105 denotes a remaining battery capacity detecting unit for detecting the remaining capacity of 1106. A numeral 1107 denotes a remaining battery capacity display unit for displaying the remaining of battery capacity from the detecting unit 1105.

The operator can confirm the remaining battery by the remaining battery capacity display unit 1105 and can set an appropriate power saving mode for computing process and the time of the process.

As described above, in the second embodiment, the remaining capacity of the battery 1106 is detected by the detecting unit 1105 and displayed in the display unit 1107 and simultaneously, the power saving mode is displayed in the power saving mode display unit 1102. ~~which is provided next to the display unit 1107.~~ Therefore, the operator ~~operation~~ ~~can~~ easily confirm the remaining battery and the power saving mode and can ~~gan~~ direct changing of the mode to a desired power saving mode. Then, the power saving mode control unit 1103 controls the processing speed of the personal computer unit 1104 and the brightness of the personal computer display unit.

Fig. 7 is a perspective of the electric equipment shown in Fig. 6. In Fig. 7, a numeral 1201 denotes a main body housing. 1202 denotes a display unit housing which includes a power saving mode changing knob 1203, a power saving mode meter 1204, and a remaining battery

meter 1205. The knob 1203 corresponds to the power saving mode switch unit 1101 in Fig. 6. The power saving mode meter 1204 corresponds to the power saving mode display unit 1102 and the remaining battery meter 1205 corresponds to the remaining battery display unit 1107 in Fig. 6.

Fig. 8 is a block diagram showing control apparatus of the electric equipment in Fig. 7. A construction and operation of the control of Fig. 7 will be described below.

A rotary switch 1301 is linked with the knob 1203 shown in Fig. 7 and swivels to ground one of terminals 1 to 6. Each contact of contacts 1-6 is returned to Vcc through a resister RA and is connected to an encoder 1302. Therefore, only the contact selected by the rotary switch 1301 is at a low level and the other five contacts are at a high level. The encoder 1302 produces three bit data in accordance with the contact selected by the rotary switch 1301. Thus, if the contact 1 is selected, the encoder 1302 produced (0,0,1). If the contact 3 is selected, the encoder 1302 produces (0,1,1). If the contact 4 is selected, (1,0,0) is produced. If the contact ~~(~~5~~)~~ is selected, (1,0,1) ~~(1,1,0)~~ is produced. If the contact 6 is selected, (1,1,0) ~~(1,1,1)~~ is produced. In this embodiment, selecting one of the contacts 1 to 6 corresponds to selecting one of power saving mode 1-6.

The three data bits from the encoder 1302 are transferred to a level converting circuit 1303. The level converting circuit 1303 converts the three data bits to level data appropriate for indication on a meter 1304 (e.g. a voltmeter) for displaying a power saving mode. The level data which is converted by the level converter circuit 1303 is converted to an analog

voltage for energizing the meter 1304 by a first D/A converter 1305. Therefore, the power saving mode of modes 1 to 6 selected by the knob 1203 is displayed by the meter 1304. The three data bits from the encoder 1302 are transferred to a first decoder circuit 1306. The first decoder circuit 1306 produces two bit data which shows a rate of divided clock frequency as described below.

That is, if the three bit data from the encoder 1302 is (0,0,1) or (0,1,0), the rate of divided clock frequency is x. If the three bit data from the encoder 1302 is (0,1,1) or (1,0,0), the rate of divided clock frequency is x/2. If the three bit data from the encoder 1302 is (1,0,1) or (1,1,0) the rate of frequency is x/4.

The two bit divided clock frequency signal from the first decoder 1306 is transferred to a producing/dividing clock circuit 1307. The producing/dividing clock circuit 1307 produces a 20 MHz clock and transfers the divided clock to a CPU unit 1308 in accordance with the dividing rate from the first decoder 1306. Namely, if the rate is x, the circuit 1307 produces a 20 MHz clock. If the rate is x/2, the circuit 1307 produces a 10 MHz clock, and if the rate is x/4, the circuit 1307 produces a 5 MHz clock.

Furthermore, the three bit data from the encoder 1302 is transferred to a second decoder 1309. The second decoder 1309 produces an electric current for driving an invertor 1312 as described below.

That is, if the three bit data from the encoder 1302 is (0,0,1), a digital value of the current for driving the inverter 1312 is (1,1) and a back light quantity of the display is 3W (3 watts). If the three bit data from the encoder

1302 is (0,1,0), (0,1,1), or (1,0,1), a digital value of the current for driving the inverter 1312 is (1,0) and the back light quantity of the display is 2W. If the three bit data from the encoder 1302 is (1,0,0) or (1,1,0), the digital value of the current for driving the inverter 1312 is (1,0) and the back light quantity of the display is 1W ~~W~~. The two bit current data from the second decoder 1309 is transferred to a second D/A converter 1310 and, after that, the converter 1310 produces current for driving an inverter 1312 which supplies voltage to the back light 1311 that may be, for example, a cold-cathode tube.

a

As described above, by operating the knob 1203, the operating frequency of the CPU unit 1308 in the personal computer unit 1104 of Fig. 6 changes between 20 MHz, 10 MHz and 5 MHz and light quantity of the back light 1312 changes between 3W, 2W and 1W ~~W~~. Thus, the CPU operating frequency is 20 MHz and the back light is 3W in the power saving mode 1. The CPU operating frequency is 20 MHz and the light quantity of the back light is 2w in the power saving mode 2. The frequency is 10 MHz and the light quantity is 2W in the mode 3. The frequency is 10 MHz and the light quantity is W in the mode 4. The frequency is 5 MHz and the light quantity is 2W in the mode 5. The frequency is 5 MHz and the light quantity is 1W ~~W~~ in the mode 6.

a a

For a higher operating frequency of the CPU 1308, the processing is faster and the electric consumption is higher. For a less ~~lower~~ working frequency of the CPU 1308, the processing is slower and the electric consumption is lower. The more the light quantity, the greater is the electric consumption. The less the light quantity, the lower is the electric consumption. Therefore, power saving mode 1 has the fastest processing and consumes

BD a

the most electricity. The power saving mode 6 has the slowest processing and consumes the least electricity.

In Fig. 8, a terminal voltage of a battery 1313 which drives the equipment is transferred to an A/D converter 1314. The A/D converter 1314 produces an eight bit digital value which is transferred to a remaining battery arithmetic circuit 1315. The circuit 1315 calculates the remaining battery in accordance with the digital value of the terminal voltage of the battery 1313. Furthermore, the circuit 1315 converts the calculated remaining battery into a digital value of a voltage which drives a meter 1316 for displaying the remaining battery. The digital value of the voltage is transferred to a third D/A converter 1317. The third D/A converter 1317 converts the voltage value into an analog voltage for driving the meter 1316 to display the remaining battery. Therefore, a needle of the meter 1316 indicates the remaining battery.

In Fig. 8, the rotary switch 1301 and the encoder 1302 correspond to the power saving mode switch unit 1101. The level converter 1303, the meter 1304 and the first D/A converter 1305 correspond to the power saving mode display unit 1102 in Fig. 6. The first decoder circuit 1306, the clock producing/dividing circuit 1307, the second decoder circuit 1309 and the second D/A converter 1310 correspond to the power saving mode control unit 1103 in Fig. 6. The CPU unit 1308 which includes the CPU and the peripheral circuit, the back light 1311 and the inverter 1312 correspond to the personal computer 1104 in Fig. 6. The battery 1313 corresponds to the battery 1106 in Fig. 6. The A/D converter 1314 and the remaining battery arithmetic circuit 1315 correspond to the remaining battery detecting unit 1105 in Fig. 6. The meter 1316 for displaying the remaining battery and the third D/A

converter 1317 correspond to the remaining battery display unit 1107 in Fig. 6.

As described above, an operator can read the meter 1316 and can select the power saving mode 1 if the remaining battery capacity is large. The operator can then obtain a high processing speed and an easy-to-see display. On the other hand, if the remaining battery capacity is low, the operator can select mode 5 or mode 6 and can get obtain long operating time at the expense of processing speed and the ease of viewing.

In this embodiment, the meters 1204 and 1205 are voltmeters. But an LED display or a liquid crystal display may be used. If lower electric power is required, the liquid crystal display is used.

Furthermore, as shown in Fig. 9, if the tip of the knob 1203 indicates the numerals 1 to 6, the power saving mode switch unit serves as the power saving mode display unit. Therefore, the number of elements and the cost of the equipment can be reduced and space for the equipment can be used efficiently.

As described above, in the second embodiment, the remaining battery capacity of battery 1106 is detected by the ~~unit~~ remaining battery detecting unit 1105 and is ~~1105 and~~ displayed in the unit 1107 and ~~simultaneously~~, the knob 1203 which is provided in close relation to the unit 1107 can simultaneously indicate the current power saving mode. Therefore, an operator can easily confirm the remaining battery and the current power saving mode and can change the mode to the desired power saving mode. Then, the power saving control unit 1103 controls the processing speed of the personal computer unit 1104 and the brightness of the display unit.

In this embodiment, the portable electric equipment is explained in terms of a personal computer, but other electrical equipment, for example, a word processor or an electric calculator may be used.

As described above, the calculated remaining of time and the adopted power saving mode are exhibited together ~~superimposed~~. Accordingly, the operator can easily understand how long the battery can supply the power if the equipment operates in the current power saving mode and can select the desirable and appropriate power saving mode to control the adequate CPU processing speed and the display unit brightness.

As described above, the detected remaining battery and the adopted power saving mode are displayed in close relationship. Therefore, the operator can easily determine ~~understand~~ how long the battery can supply power if the equipment operates in the current power saving mode and can select the desirable and appropriate power saving mode to provide adequate processing speed ~~of the~~ and adequate display brightness ~~the adequate brightness of the display unit~~.

As described above, the detected remaining battery and the adopted power saving mode are indicated by the indicators. Therefore, the operator can easily understand how long the battery can supply power and can select the desirable and appropriate power saving mode to provide adequate processing speed of CPU and adequate brightness of the display unit.

As described above the present invention can provide electric equipment capable of superimposing remaining operating time and the adopted power saving mode. Accordingly, the operator can easily understand how long the battery can supply power if the equipment operates in the current power saving mode and the

operator can select a desirable power saving mode to provide adequate processing speed of the CPU and adequate brightness of the display unit.

The present invention can provide electric equipment capable of displaying in close relationship the detected remaining battery capacity and the adopted power saving mode so that the operator can easily understand how long the battery can supply power if the equipment operates in the current power saving mode and can select the desirable and appropriate power saving mode to control processing speed of the CPU and brightness of the display unit.

The present invention can provide electric equipment capable of indicating the detected remaining battery capacity and the adopted power saving mode. Therefore, the operator can easily understand how long the battery can supply power and can select the desirable and appropriate power saving mode to control the processing speed of the CPU and the brightness of the display unit.

It is to be understood that the specific embodiments described herein are merely illustrative of the spirit and scope of the invention. Modifications can readily be made by those skilled in the art in accordance with the principles of the invention.